



Dart Aerospace Ltd.  
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**D212-664-101TRN**  
**Job Sheet 187532**



**Part No:** D212-664-101TRN

**Job Qty:** 1 ea

**Part Name:** Crosstube Turning Detail



**Part Weight:** 0 lbs

**Status:** New

**Priority:** Medium

**Job Created:** 12/6/18

**Job Tracking No:**

**Due Date:** 12/21/18

**Created By:** Jesse White

**Type:** Stock

**Description:**

**Note:** DWG REV E IPP Rev:A 08-03-06 new issue DD verified by:ec IPP Rev B 08.04.02 removed Polish EC verified by: DD

**Ship Via:**

### Bill of Materials

### Job Routing

| Op No | Operation          | Qty   | Start Date | Due Date | Standard  |         | Workcenter/Supplier   |           | Sign-off       |
|-------|--------------------|-------|------------|----------|-----------|---------|-----------------------|-----------|----------------|
|       |                    |       |            |          | Setup Hrs | Run Hrs | Workcenter / Supplier | Lead Time |                |
| 90    | Start up Operation | 1 Ea  | 12/21/18   | 12/21/18 | 0.00      | 0.00    | Start Up Crosstubes-1 |           | MD/2018-12-10  |
| 100   | Mori Seiki         | 1 pcs | 12/21/18   | 12/21/18 | 4.40      | 2.38    | Mori Seiki TL-40      |           | MD/2018-12-11  |
| 110   | QC                 | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 0.00    | QC2-1                 |           | MD/2018-12-17  |
| 120   | Mori Seiki         | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 2.38    | Mori Seiki TL-40      |           | DAS 67         |
| 130   | QC                 | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 0.00    | QC2-1                 |           | DPZ 9-89       |
| 140   | QC                 | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 0.00    | QC8                   |           | DPZ            |
| 145   | Crosstubes         | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 0.68    | Crosstubes-1          |           | DPZ            |
| 150   | HandFXtube         | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 1.00    | Crosstubes-3          |           | DPZ            |
| 160   | QC                 | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 0.00    | QC7-1                 |           | - DPZ 18-12-19 |
| 170   | Packaging          | 1 pcs | 12/21/18   | 12/21/18 | 0.00      | 0.00    | Packaging3-1          |           | DEC 19 2018    |
| 180   | QC21-SA            | 1 Ea  | 12/21/18   | 12/21/18 | 0.00      | 0.00    | QC21                  |           | 9-89           |

Part Op 100 - 1- Fill tube with sand & install plugs 212-141 on both ends as per Folio FA113 3- Turn first taper section on both side  
Descriptions: as per folio FA113

120 - 1- Turn second taper on both side 4- Scribe part # and batch # using vibrating stylus on the cuff as per Dwg D212-664-141

145 - GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.

150 - 1- handfinish X-TUBE INSIDE AND OUT

170 - LOCATION : LG014

### Job BOM

| Part / Item | Component Name     | Quantity    | Operation             | Container |
|-------------|--------------------|-------------|-----------------------|-----------|
| D6005-128   | Crosstube Material | 1 Ea (1 ea) | 90-Start up Operation | B139 414  |

### Job Allocations

| Operation             | Component Part | Required | Inventory | Allocated |
|-----------------------|----------------|----------|-----------|-----------|
| 90-Start up Operation | D6005-128      | 1        | 43        | 0         |

### Part Specifications

Specifications could not be found.

Plex 12/6/18 12:58 PM dart.white.jesse



Entered: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE



NCR No. \_\_\_\_\_

Route update only ☐

### DISPOSITION

Job: \_\_\_\_\_

Part No. \_\_\_\_\_

Rework ☐

Scrap ☐

Use-as-is ☐

Date : \_\_\_\_\_

Sequence #: \_\_\_\_\_

### Description Work Order Deviation

Part: D212 - 664 - 101TRN  
Job No: 187532  
Serial No/Batch: S136136  
Revision: E  
Inspector: \_\_\_\_\_  
Exp Date: \_\_\_\_\_  
Instructions: \_\_\_\_\_

Date: 12/10/18



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### Root Cause

Operator ☐  
Manufacturing Process ☐  
Equip/Tooling ☐  
Handling/Presservation ☐  
Material ☐  
Product Improvement ☐  
Process Improvement ☐  
Human Factors ☐

### FAULT CATEGORY

|                                                       |                                                          |                                             |                                            |
|-------------------------------------------------------|----------------------------------------------------------|---------------------------------------------|--------------------------------------------|
| <input type="checkbox"/> Pressure/Forced              | <input type="checkbox"/> Contamination                   | <input type="checkbox"/> Power Loss/Surge   | <input type="checkbox"/> Positioned Wrong  |
| <input type="checkbox"/> Bending                      | <input type="checkbox"/> Misaligned/off center           | <input type="checkbox"/> Folio/Program      | <input type="checkbox"/> Outside Tolerance |
| <input type="checkbox"/> Crushing                     | <input type="checkbox"/> BOM/Route                       | <input type="checkbox"/> Grain Direction    | <input type="checkbox"/> Drawing           |
| <input type="checkbox"/> Cracks                       | <input type="checkbox"/> Broken/Damage/Defect            | <input type="checkbox"/> Weld               | <input type="checkbox"/> Finish            |
| <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist | <input type="checkbox"/> Incomplete/Unclear Instructions | <input type="checkbox"/> Wrong Stock Pulled | <input type="checkbox"/> Part Lost/Missing |
| <input type="checkbox"/> Marks/Chatter                | <input type="checkbox"/> Drill Holes                     | <input type="checkbox"/> Out of Sequence    | <input type="checkbox"/> Misread           |
| <input type="checkbox"/> Mislabeled                   | <input type="checkbox"/> Fit/Function                    | <input type="checkbox"/> Off-set/Set-up     |                                            |

Other/Details: \_\_\_\_\_



|                                                               |                     |                    |
|---------------------------------------------------------------|---------------------|--------------------|
| <b>DART AEROSPACE LTD</b>                                     | <b>Work Order:</b>  | 187532             |
| <b>Description:</b> Crosstube Assembly (205/212/412 High Fwd) | <b>Part Number:</b> | D212-664-141       |
| <b>Inspection Dwg:</b> D212-664-141 <b>Rev:</b> E             |                     | <b>Page 1 of 2</b> |

### FIRST ARTICLE INSPECTION CHECKLIST

|        | Inspection Sheet<br>Drawing Dimension | Tolerance     | Actual<br>Dimension | Accept | Reject | Method of<br>Inspection | Comments |
|--------|---------------------------------------|---------------|---------------------|--------|--------|-------------------------|----------|
| SIDE A | 0.200                                 | +/-0.010      | .210                | ✓      |        | CNC-08                  |          |
|        | R0.063                                | +/-0.010      | .063                | ✓      |        | RG                      |          |
|        | 2.740                                 | +0.005/-0.000 | 2.743               | ✓      |        | CNC-04                  |          |
|        | 5.097                                 | +/-0.030      | 5.103               | ✓      |        | CNC-08                  |          |
|        | 2.304                                 | +0.005/-0.000 | 2.309               | ✓      |        | CNC-04                  |          |
|        | 2.340                                 | +0.005/-0.000 | 2.345               | ✓      |        |                         |          |
|        | 2.398                                 | +0.005/-0.000 | 2.403               | ✓      |        |                         |          |
|        | 2.448                                 | +0.005/-0.000 | 2.453               | ✓      |        |                         |          |
|        | 2.498                                 | +0.005/-0.000 | 2.502               | ✓      |        |                         |          |
|        | 2.549                                 | +0.005/-0.000 | 2.554               | ✓      |        |                         |          |
|        | 2.599                                 | +0.005/-0.000 | 2.604               | ✓      |        |                         |          |
|        | 2.671                                 | +0.005/-0.000 | 2.676               | ✓      |        |                         |          |
|        | 2.701                                 | +0.005/-0.000 | 2.706               | ✓      |        |                         |          |
|        |                                       |               |                     |        |        |                         |          |
| SIDE B | 0.200                                 | +/-0.010      | .210                | ✓      |        | CNC-08                  |          |
|        | R0.063                                | +/-0.010      | .063                | ✓      |        | RG                      |          |
|        | 2.740                                 | +0.005/-0.000 | 2.743               | ✓      |        | CNC-04                  |          |
|        | 5.097                                 | +/-0.030      | 5.102               | ✓      |        | CNC-08                  |          |
|        | 2.304                                 | +0.005/-0.000 | 2.309               | ✓      |        | CNC-04                  |          |
|        | 2.340                                 | +0.005/-0.000 | 2.345               | ✓      |        |                         |          |
|        | 2.398                                 | +0.005/-0.000 | 2.403               | ✓      |        |                         |          |
|        | 2.448                                 | +0.005/-0.000 | 2.453               | ✓      |        |                         |          |
|        | 2.498                                 | +0.005/-0.000 | 2.502               | ✓      |        |                         |          |
|        | 2.549                                 | +0.005/-0.000 | 2.554               | ✓      |        |                         |          |
|        | 2.599                                 | +0.005/-0.000 | 2.604               | ✓      |        |                         |          |
|        | 2.671                                 | +0.005/-0.000 | 2.676               | ✓      |        |                         |          |
|        | 2.701                                 | +0.005/-0.000 | 2.706               | ✓      |        |                         |          |
|        | 126.514                               | +/-0.020      | 126.510             | ✓      |        | Tape                    |          |



Entered: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

Route update only ☐

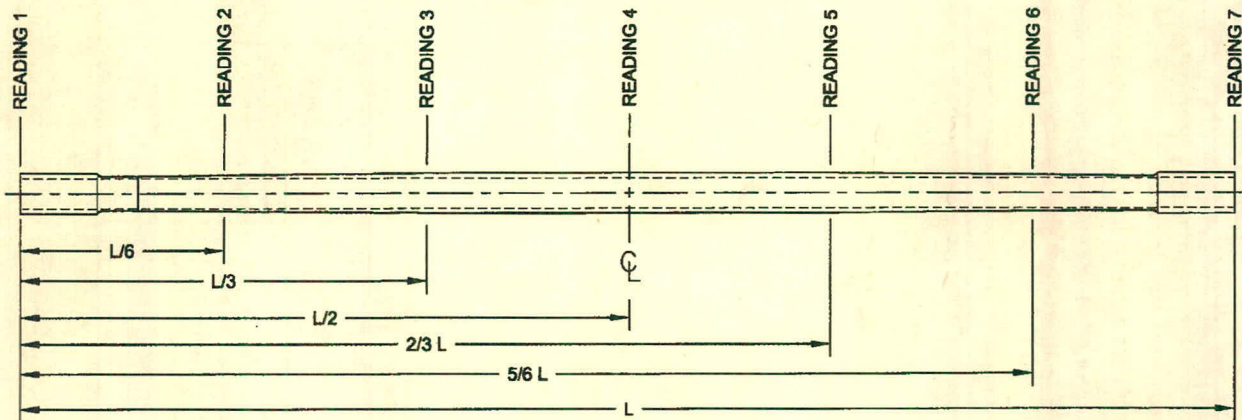
|                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                               |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------|--|
| <b>Job:</b> _____<br><b>Part No.</b> _____                                                                                                                                                                                                                                                                                                                                           |  | <b>DISPOSITION</b><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>DEPARTMENT/PROCESS</b><br>Skid-tube <input type="checkbox"/><br>Machining <input type="checkbox"/><br>Large Fab <input type="checkbox"/><br>Cross tube <input type="checkbox"/><br>Small Fab <input type="checkbox"/><br>Finishing <input type="checkbox"/><br>Eng. (Non-AW) <input type="checkbox"/><br>Prod. Eng. Coord. <input type="checkbox"/><br>Rec/Store/Packaging <input type="checkbox"/><br>Engineering <input type="checkbox"/><br>Water Jet <input type="checkbox"/><br>Supplier <input type="checkbox"/><br>Quality <input type="checkbox"/> |  |                               |  |
| <b>Date :</b> _____                                                                                                                                                                                                                                                                                                                                                                  |  | <b>Sequence #:</b> _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  | <b>QTY Affected :</b> _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | <b>MRB (QSI042)</b>           |  |
| <b>Description Work Order Deviation</b>                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | <b>Disposition</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | <b>Completed By</b>           |  |
|                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>Lead hand / Supervisor</b> |  |
|                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                               |  |
|                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | <b>QC / QA Coordinator</b>    |  |
| <b>Root Cause</b><br>Operator <input type="checkbox"/><br>Manufacturing Process <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Presservation <input type="checkbox"/><br>Material <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Human Factors <input type="checkbox"/> |  | <b>FAULT CATEGORY</b><br><input type="checkbox"/> Pressure/Forced<br><input type="checkbox"/> Bending<br><input type="checkbox"/> Crushing<br><input type="checkbox"/> Cracks<br><input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist<br><input type="checkbox"/> Marks/Chatter<br><input type="checkbox"/> Mislabeled<br><input type="checkbox"/> Contamination<br><input type="checkbox"/> Misaligned/off center<br><input type="checkbox"/> BOM/Route<br><input type="checkbox"/> Broken/Damage/Defect<br><input type="checkbox"/> Incomplete/Unclear Instructions<br><input type="checkbox"/> Drill Holes<br><input type="checkbox"/> Fit/Function<br><input type="checkbox"/> Power Loss/Surge<br><input type="checkbox"/> Folio/Program<br><input type="checkbox"/> Grain Direction<br><input type="checkbox"/> Weld<br><input type="checkbox"/> Wrong Stock Pulled<br><input type="checkbox"/> Out of Sequence<br><input type="checkbox"/> Off-set/Set-up<br><input type="checkbox"/> Positioned Wrong<br><input type="checkbox"/> Outside Tolerance<br><input type="checkbox"/> Drawing<br><input type="checkbox"/> Finish<br><input type="checkbox"/> Part Lost/Missing<br><input type="checkbox"/> Misread |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                               |  |
|                                                                                                                                                                                                                                                                                                                                                                                      |  | <b>Other/Details:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                               |  |



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|                                                        |              |              |
|--------------------------------------------------------|--------------|--------------|
| DART AEROSPACE LTD                                     | Work Order:  | 187532       |
| Description: Crosstube Assembly (205/212/412 High Fwd) | Part Number: | D212-664-141 |
| Inspection Dwg: D212-664-141 Rev: E                    |              | Page 2 of 2  |

### WALL THICKNESS MEASUREMENT



| Location                 | WALL THICKNESS MEASUREMENT (IN) |     |     |     | Deviation<br>$\Delta w$<br>(max-min) | TOLERANCE |
|--------------------------|---------------------------------|-----|-----|-----|--------------------------------------|-----------|
|                          | w1                              | w2  | w3  | w4  |                                      |           |
| READING 1<br>L = 0"      | 374                             | 374 | 379 | 377 | .005                                 | 0.048"    |
| READING 2<br>L = 21.09   | 244                             | 215 | 230 | 264 | .049                                 |           |
| READING 3<br>L = 42.17   | 353                             | 344 | 351 | 360 | .016                                 |           |
| READING 4<br>L = 63.25   | 384                             | 372 | 379 | 384 | .012                                 |           |
| READING 5<br>L = 84.34   | 350                             | 344 | 354 | 358 | .014                                 |           |
| READING 6<br>L = 105.43  | 233                             | 231 | 241 | 245 | .014                                 |           |
| READING 7<br>L = 126.514 | 374                             | 370 | 376 | 385 | .015                                 |           |

Dwg  $\Delta$   
0.232 - 0.017  
Mean = 0.238

MIN = -0.017  
MEAN = +0.006

Acceptable

DAS  
12 18/12/17  
9-89

#### Calibration Result

Actual Block Thickness: 200-400

Sitescan 250 Measured Thickness: 200-400

|              |            |
|--------------|------------|
| Measured by: | MD         |
| Date:        | 2018-12-17 |

|             |                |
|-------------|----------------|
| Audited by: | DAS 67<br>9-89 |
| Date:       | 2018-12-18     |

|                       |  |
|-----------------------|--|
| Preliminary Approval: |  |
| Date:                 |  |

| Rev | Date     | Change                             | Revised by | Approved |
|-----|----------|------------------------------------|------------|----------|
| C   | 07.05.28 | Dwg Rev updated (P/O D412-664-101) | KJ/JLM     |          |
| D   | 10.02.02 | Dimension 126.514 was 126.51       | KJ         |          |
| E   | 12.06.04 | Wall thickness form added          | KJ         |          |
| F   | 14.06.05 | Dwg Rev updated                    | KJ         |          |



Entered: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

Route update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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| Job: _____<br><br>Part No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/> | <b>DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/> </div> <div>           Eng. (Non-AW) <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Water Jet <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Quality <input type="checkbox"/> </div> </div> |  |                        |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Sequence #:                                                                                                                       | QTY Affected :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  | MRB (QSI042)           |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | Completed By           |  |
| <div style="color: red; font-size: 2em; opacity: 0.5;">             101<br/>102<br/>103<br/>104<br/>105<br/>106<br/>107<br/>108<br/>109<br/>110<br/>111<br/>112<br/>113<br/>114<br/>115<br/>116<br/>117<br/>118<br/>119<br/>120<br/>121<br/>122<br/>123<br/>124<br/>125<br/>126<br/>127<br/>128<br/>129<br/>130<br/>131<br/>132<br/>133<br/>134<br/>135<br/>136<br/>137<br/>138<br/>139<br/>140<br/>141<br/>142<br/>143<br/>144<br/>145<br/>146<br/>147<br/>148<br/>149<br/>150<br/>151<br/>152<br/>153<br/>154<br/>155<br/>156<br/>157<br/>158<br/>159<br/>160<br/>161<br/>162<br/>163<br/>164<br/>165<br/>166<br/>167<br/>168<br/>169<br/>170<br/>171<br/>172<br/>173<br/>174<br/>175<br/>176<br/>177<br/>178<br/>179<br/>180<br/>181<br/>182<br/>183<br/>184<br/>185<br/>186<br/>187<br/>188<br/>189<br/>190<br/>191<br/>192<br/>193<br/>194<br/>195<br/>196<br/>197<br/>198<br/>199<br/>200<br/>201<br/>202<br/>203<br/>204<br/>205<br/>206<br/>207<br/>208<br/>209<br/>210<br/>211<br/>212<br/>213<br/>214<br/>215<br/>216<br/>217<br/>218<br/>219<br/>220<br/>221<br/>222<br/>223<br/>224<br/>225<br/>226<br/>227<br/>228<br/>229<br/>230<br/>231<br/>232<br/>233<br/>234<br/>235<br/>236<br/>237<br/>238<br/>239<br/>240<br/>241<br/>242<br/>243<br/>244<br/>245<br/>246<br/>247<br/>248<br/>249<br/>250<br/>251<br/>252<br/>253<br/>254<br/>255<br/>256<br/>257<br/>258<br/>259<br/>260<br/>261<br/>262<br/>263<br/>264<br/>265<br/>266<br/>267<br/>268<br/>269<br/>270<br/>271<br/>272<br/>273<br/>274<br/>275<br/>276<br/>277<br/>278<br/>279<br/>280<br/>281<br/>282<br/>283<br/>284<br/>285<br/>286<br/>287<br/>288<br/>289<br/>290<br/>291<br/>292<br/>293<br/>294<br/>295<br/>296<br/>297<br/>298<br/>299<br/>300<br/>301<br/>302<br/>303<br/>304<br/>305<br/>306<br/>307<br/>308<br/>309<br/>310<br/>311<br/>312<br/>313<br/>314<br/>315<br/>316<br/>317<br/>318<br/>319<br/>320<br/>321<br/>322<br/>323<br/>324<br/>325<br/>326<br/>327<br/>328<br/>329<br/>330<br/>331<br/>332<br/>333<br/>334<br/>335<br/>336<br/>337<br/>338<br/>339<br/>340<br/>341<br/>342<br/>343<br/>344<br/>345<br/>346<br/>347<br/>348<br/>349<br/>350<br/>351<br/>352<br/>353<br/>354<br/>355<br/>356<br/>357<br/>358<br/>359<br/>360<br/>361<br/>362<br/>363<br/>364<br/>365<br/>366<br/>367<br/>368<br/>369<br/>370<br/>371<br/>372<br/>373<br/>374<br/>375<br/>376<br/>377<br/>378<br/>379<br/>380<br/>381<br/>382<br/>383<br/>384<br/>385<br/>386<br/>387<br/>388<br/>389<br/>390<br/>391<br/>392<br/>393<br/>394<br/>395<br/>396<br/>397<br/>398<br/>399<br/>400<br/>401<br/>402<br/>403<br/>404<br/>405<br/>406<br/>407<br/>408<br/>409<br/>410<br/>411<br/>412<br/>413<br/>414<br/>415<br/>416<br/>417<br/>418<br/>419<br/>420<br/>421<br/>422<br/>423<br/>424<br/>425<br/>426<br/>427<br/>428<br/>429<br/>430<br/>431<br/>432<br/>433<br/>434<br/>435<br/>436<br/>437<br/>438<br/>439<br/>440<br/>441<br/>442<br/>443<br/>444<br/>445<br/>446<br/>447<br/>448<br/>449<br/>450<br/>451<br/>452<br/>453<br/>454<br/>455<br/>456<br/>457<br/>458<br/>459<br/>460<br/>461<br/>462<br/>463<br/>464<br/>465<br/>466<br/>467<br/>468<br/>469<br/>470<br/>471<br/>472<br/>473<br/>474<br/>475<br/>476<br/>477<br/>478<br/>479<br/>480<br/>481<br/>482<br/>483<br/>484<br/>485<br/>486<br/>487<br/>488<br/>489<br/>490<br/>491<br/>492<br/>493<br/>494<br/>495<br/>496<br/>497<br/>498<br/>499<br/>500<br/>501<br/>502<br/>503<br/>504<br/>505<br/>506<br/>507<br/>508<br/>509<br/>510<br/>511<br/>512<br/>513<br/>514<br/>515<br/>516<br/>517<br/>518<br/>519<br/>520<br/>521<br/>522<br/>523<br/>524<br/>525<br/>526<br/>527<br/>528<br/>529<br/>530<br/>531<br/>532<br/>533<br/>534<br/>535<br/>536<br/>537<br/>538<br/>539<br/>540<br/>541<br/>542<br/>543<br/>544<br/>545<br/>546<br/>547<br/>548<br/>549<br/>550<br/>551<br/>552<br/>553<br/>554<br/>555<br/>556<br/>557<br/>558<br/>559<br/>560<br/>561<br/>562<br/>563<br/>564<br/>565<br/>566<br/>567<br/>568<br/>569<br/>570<br/>571<br/>572<br/>573<br/>574<br/>575<br/>576<br/>577<br/>578<br/>579<br/>580<br/>581<br/>582<br/>583<br/>584<br/>585<br/>586<br/>587<br/>588<br/>589<br/>590<br/>591<br/>592<br/>593<br/>594<br/>595<br/>596<br/>597<br/>598<br/>599<br/>600<br/>601<br/>602<br/>603<br/>604<br/>605<br/>606<br/>607<br/>608<br/>609<br/>610<br/>611<br/>612<br/>613<br/>614<br/>615<br/>616<br/>617<br/>618<br/>619<br/>620<br/>621<br/>622<br/>623<br/>624<br/>625<br/>626<br/>627<br/>628<br/>629<br/>630<br/>631<br/>632<br/>633<br/>634<br/>635<br/>636<br/>637<br/>638<br/>639<br/>640<br/>641<br/>642<br/>643<br/>644<br/>645<br/>646<br/>647<br/>648<br/>649<br/>650<br/>651<br/>652<br/>653<br/>654<br/>655<br/>656<br/>657<br/>658<br/>659<br/>660<br/>661<br/>662<br/>663<br/>664<br/>665<br/>666<br/>667<br/>668<br/>669<br/>670<br/>671<br/>672<br/>673<br/>674<br/>675<br/>676<br/>677<br/>678<br/>679<br/>680<br/>681<br/>682<br/>683<br/>684<br/>685<br/>686<br/>687<br/>688<br/>689<br/>690<br/>691<br/>692<br/>693<br/>694<br/>695<br/>696<br/>697<br/>698<br/>699<br/>700<br/>701<br/>702<br/>703<br/>704<br/>705<br/>706<br/>707<br/>708<br/>709<br/>710<br/>711<br/>712<br/>713<br/>714<br/>715<br/>716<br/>717<br/>718<br/>719<br/>720<br/>721<br/>722<br/>723<br/>724<br/>725<br/>726<br/>727<br/>728<br/>729<br/>730<br/>731<br/>732<br/>733<br/>734<br/>735<br/>736<br/>737<br/>738<br/>739<br/>740<br/>741<br/>742<br/>743<br/>744<br/>745<br/>746<br/>747<br/>748<br/>749<br/>750<br/>751<br/>752<br/>753<br/>754<br/>755<br/>756<br/>757<br/>758<br/>759<br/>760<br/>761<br/>762<br/>763<br/>764<br/>765<br/>766<br/>767<br/>768<br/>769<br/>770<br/>771<br/>772<br/>773<br/>774<br/>775<br/>776<br/>777<br/>778<br/>779<br/>780<br/>781<br/>782<br/>783<br/>784<br/>785<br/>786<br/>787<br/>788<br/>789<br/>790<br/>791<br/>792<br/>793<br/>794<br/>795<br/>796<br/>797<br/>798<br/>799<br/>800<br/>801<br/>802<br/>803<br/>804<br/>805<br/>806<br/>807<br/>808<br/>809<br/>810<br/>811<br/>812<br/>813<br/>814<br/>815<br/>816<br/>817<br/>818<br/>819<br/>820<br/>821<br/>822<br/>823<br/>824<br/>825<br/>826<br/>827<br/>828<br/>829<br/>830<br/>831<br/>832<br/>833<br/>834<br/>835<br/>836<br/>837<br/>838<br/>839<br/>840<br/>841<br/>842<br/>843<br/>844<br/>845<br/>846<br/>847<br/>848<br/>849<br/>850<br/>851<br/>852<br/>853<br/>854<br/>855<br/>856<br/>857<br/>858<br/>859<br/>860<br/>861<br/>862<br/>863<br/>864<br/>865<br/>866<br/>867<br/>868<br/>869<br/>870<br/>871<br/>872<br/>873<br/>874<br/>875<br/>876<br/>877<br/>878<br/>879<br/>880<br/>881<br/>882<br/>883<br/>884<br/>885<br/>886<br/>887<br/>888<br/>889<br/>890<br/>891<br/>892<br/>893<br/>894<br/>895<br/>896<br/>897<br/>898<br/>899<br/>900<br/>901<br/>902<br/>903<br/>904<br/>905<br/>906<br/>907<br/>908<br/>909<br/>910<br/>911<br/>912<br/>913<br/>914<br/>915<br/>916<br/>917<br/>918<br/>919<br/>920<br/>921<br/>922<br/>923<br/>924<br/>925<br/>926<br/>927<br/>928<br/>929<br/>930<br/>931<br/>932<br/>933<br/>934<br/>935<br/>936<br/>937<br/>938<br/>939<br/>940<br/>941<br/>942<br/>943<br/>944<br/>945<br/>946<br/>947<br/>948<br/>949<br/>950<br/>951<br/>952<br/>953<br/>954<br/>955<br/>956<br/>957<br/>958<br/>959<br/>960<br/>961<br/>962<br/>963<br/>964<br/>965<br/>966<br/>967<br/>968<br/>969<br/>970<br/>971<br/>972<br/>973<br/>974<br/>975<br/>976<br/>977<br/>978<br/>979<br/>980<br/>981<br/>982<br/>983<br/>984<br/>985<br/>986<br/>987<br/>988<br/>989<br/>990<br/>991<br/>992<br/>993<br/>994<br/>995<br/>996<br/>997<br/>998<br/>999<br/>1000           </div> |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | Lead hand / Supervisor |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        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                                                                                                                                                                                                                       |  | QC / QA Coordinator    |  |
| <b>Root Cause</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Operator <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Presservation <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Human Factors <input type="checkbox"/> </div> <div>           Pressure/Forced <input type="checkbox"/><br/>           Bending <input type="checkbox"/><br/>           Crushing <input type="checkbox"/><br/>           Cracks <input type="checkbox"/><br/>           Crimp/Kink/Ripple/Wave/Twist <input type="checkbox"/><br/>           Marks/Chatter <input type="checkbox"/><br/>           Mislabeled <input type="checkbox"/> </div> <div>           Contamination <input type="checkbox"/><br/>           Misaligned/off center <input type="checkbox"/><br/>           BOM/Route <input type="checkbox"/><br/>           Broken/Damage/Defect <input type="checkbox"/><br/>           Incomplete/Unclear Instructions <input type="checkbox"/><br/>           Drill Holes <input type="checkbox"/><br/>           Fit/Function <input type="checkbox"/> </div> <div>           Power Loss/Surge <input type="checkbox"/><br/>           Folio/Program <input type="checkbox"/><br/>           Grain Direction <input type="checkbox"/><br/>           Weld <input type="checkbox"/><br/>           Wrong Stock Pulled <input type="checkbox"/><br/>           Out of Sequence <input type="checkbox"/><br/>           Off-set/Set-up <input type="checkbox"/> </div> <div>           Positioned Wrong <input type="checkbox"/><br/>           Outside Tolerance <input type="checkbox"/><br/>           Drawing <input type="checkbox"/><br/>           Finish <input type="checkbox"/><br/>           Part Lost/Missing <input type="checkbox"/><br/>           Misread <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                   | Other/Details: _____<br><br>_____<br><br>_____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |                        |  |



| Item | Qty<br>-141 | Qty<br>-141B | Qty<br>-141F | Part Number     | Description                                             |
|------|-------------|--------------|--------------|-----------------|---------------------------------------------------------|
| 1    | X           |              |              | D212-664-141    | CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)               |
| 2    |             | X            |              | D212-664-141B   | CROSSTUBE ASSEMBLY (214 HIGH FWD)                       |
| 3    |             |              | X            | D212-664-141F   | CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)<br>(ANODIZED) |
| 4    | 1           | 1            | 1            | D6005-128       | CROSSTUBE                                               |
| 5    | 2           |              | 2            | D2893-1         | SUPPORT                                                 |
| 6    | 4           | 4            | 4            | D3595-063-450   | RUBBER CUSHION                                          |
| 7    |             | 2            |              | D5017-1         | SUPPORT                                                 |
| 8    | 4           | 4            | 4            | MS21920-25      | CLAMP (OR MS21920-26)                                   |
| 9    | A/R         | A/R          | A/R          | PROSEAL 890 B-2 | SEALANT, AMS-S-8802 CLASS B-2                           |

#### GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6005-128  
FINISHED LENGTH = 126.514±0.020
- FINISH -141 & -141B: a) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
b) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
c) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)  
d) PAINT OUTSIDE PER DART QSI 005 4.2  
e) REMOVE MASKING AND APPLY MATTE CLEAR COAT  
FINISH -141F: a) ANODIZE PER MIL-A-8825. TYPE II. CLASS 1.  
b) ALODINE (DO NOT ETCH) PER QSI 005 4.1.2  
c) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
d) MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2 / C6-3, HATCHED AREA)  
e) PAINT OUTSIDE PER DART QSI 005 4.2  
f) REMOVE MASKING AND APPLY MATTE CLEAR COAT  
**\*NOTE:** BETWEEN FINISHING OPERATIONS EXTREME CARE MUST BE TAKEN NOT TO CONTAMINATE OR DAMAGE FINISHED SURFACES.
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS
- WEIGHT: D212-664-141/-141B/-141F = 33.6 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

#### MACHINING

- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.

#### BENDING

- BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7.2% (BASED ON O.D.) IN LOWER HALF OF R35.5 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

#### ASSEMBLY

- TO INSTALL D2893-1 / D5017-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

RELEASED  
2014-05-26  
WJD

|            |                                                                                                                                                                                                                                                                                                          |    |          |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----------|
| E          | ADD -141F. D5017-1 WAS D2893-1 (-141B), PROSEAL WAS MAGNOBOND, NOTE 2: ADD INSPECTION WINDOW, NOTE 11: ALLOW 7.2% CRUSH, NOTE 15: ADD 72HR CURE AND RETORQUE FOR PROSEAL, ADD SHEET 3, CLAMPS REVERSED TO PREVENT CHAFING (B7-2, B7-3), BEND HEIGHT TOL. NOW 0.25 WAS 0.13 (C1-3), INCORP. DEO D-1/-2/-3 | CP | 14.04.01 |
| D          | REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C6-3 & B6-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4           | RF | 09.09.30 |
| C          | REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS                                                                                                                                                                                                                                  | PH | 07.03.08 |
| B          | ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES                                                                                                                                                                                                                                                        | PH | 05.02.04 |
| A          | NEW ISSUE                                                                                                                                                                                                                                                                                                | CP | 00.12.12 |
| REV.       | DESCRIPTION                                                                                                                                                                                                                                                                                              | BY | DATE     |
| DESIGN     |                                                                                                                                                                                                                                                                                                          |    |          |
| DRAWN      |                                                                                                                                                                                                                                                                                                          |    |          |
| CHECKED    |                                                                                                                                                                                                                                                                                                          |    |          |
| MFG. APPR. |                                                                                                                                                                                                                                                                                                          |    |          |
| APPROVED   |                                                                                                                                                                                                                                                                                                          |    |          |
| DE APPR.   |                                                                                                                                                                                                                                                                                                          |    |          |
| DATE       | 14.04.01                                                                                                                                                                                                                                                                                                 |    |          |

|                                                                                                                                                                                                                                                                          |                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <b>DART AEROSPACE LTD</b><br>HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                 |                        |
| DRAWING NO.<br>D212-664-141                                                                                                                                                                                                                                              | REV. E<br>SHEET 1 OF 5 |
| TITLE<br>XTUBE ASS'Y (205/212/412 HI FWD)                                                                                                                                                                                                                                | SCALE<br>NTS           |
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Entered: \_\_\_\_\_ Date: \_\_\_\_\_



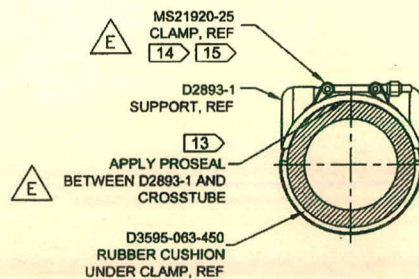
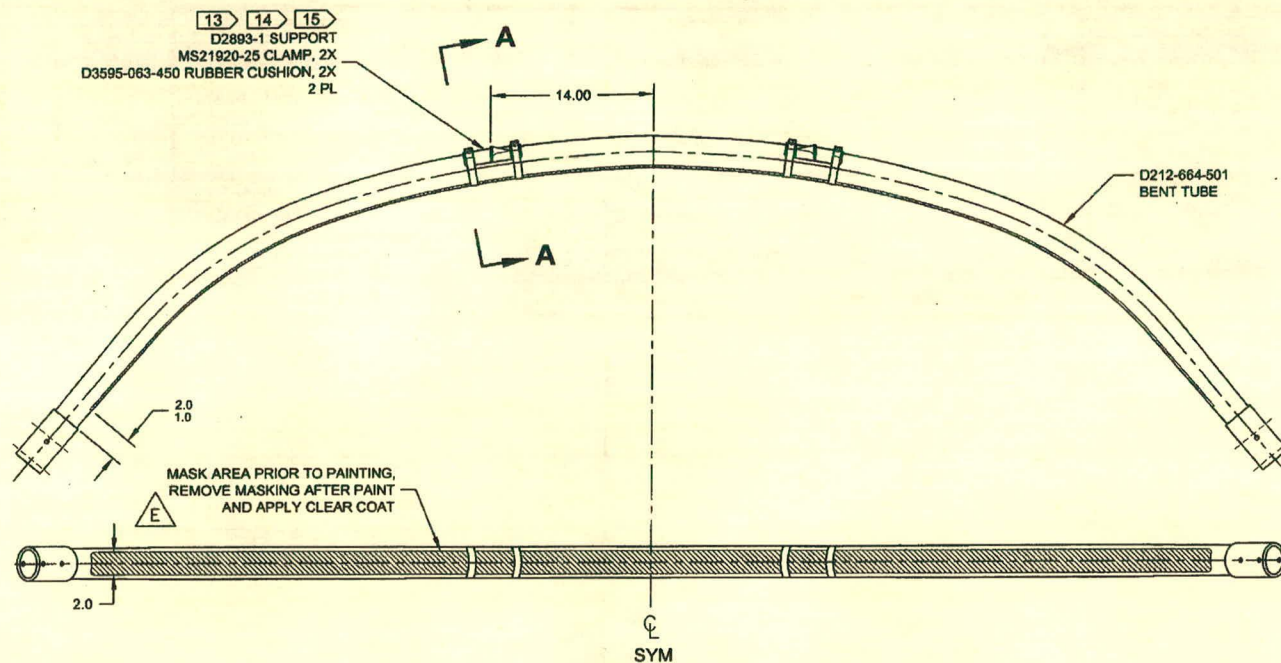
## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

Route update only ☐

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| Job: _____<br><br>Part No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/> | <b>DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/> </div> <div>           Eng. (Non-AW) <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Water Jet <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Quality <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                      |  |                        |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Sequence #: _____                                                                                                                 | QTY Affected : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | MRB (QSI042)           |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | Completed By           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Lead hand / Supervisor |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | QC / QA Coordinator    |  |
| <b>Root Cause</b><br><br><div style="display: flex;"> <div style="flex: 1;">           Operator <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Presservation <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Human Factors <input type="checkbox"/> </div> <div style="flex: 1;"> <input type="checkbox"/> Pressure/Forced<br/> <input type="checkbox"/> Bending<br/> <input type="checkbox"/> Crushing<br/> <input type="checkbox"/> Cracks<br/> <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist<br/> <input type="checkbox"/> Marks/Chatter<br/> <input type="checkbox"/> Mislabeled         </div> </div> |                                                                                                                                   | <b>FAULT CATEGORY</b><br><br><div style="display: flex;"> <div style="flex: 1;"> <input type="checkbox"/> Contamination<br/> <input type="checkbox"/> Misaligned/off center<br/> <input type="checkbox"/> BOM/Route<br/> <input type="checkbox"/> Broken/Damage/Defect<br/> <input type="checkbox"/> Incomplete/Unclear Instructions<br/> <input type="checkbox"/> Drill Holes<br/> <input type="checkbox"/> Fit/Function         </div> <div style="flex: 1;"> <input type="checkbox"/> Power Loss/Surge<br/> <input type="checkbox"/> Folio/Program<br/> <input type="checkbox"/> Grain Direction<br/> <input type="checkbox"/> Weld<br/> <input type="checkbox"/> Wrong Stock Pulled<br/> <input type="checkbox"/> Out of Sequence<br/> <input type="checkbox"/> Off-set/Set-up         </div> <div style="flex: 1;"> <input type="checkbox"/> Positioned Wrong<br/> <input type="checkbox"/> Outside Tolerance<br/> <input type="checkbox"/> Drawing<br/> <input type="checkbox"/> Finish<br/> <input type="checkbox"/> Part Lost/Missing<br/> <input type="checkbox"/> Misread         </div> </div> |  |                        |  |
| Other/Details:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                        |  |





**D212-664-141/-141F  
ASSEMBLY DETAIL**

**RELEASED**  
2014-05-26  
ND

|            |          |                                                                                                                                                                                                                                                                                         |              |
|------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     |          | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                               |              |
| DRAWN      |          | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                             |              |
| CHECKED    |          | DRAWING NO.                                                                                                                                                                                                                                                                             | REV. E       |
| MFG. APPR. |          | D212-664-141                                                                                                                                                                                                                                                                            | SHEET 2 OF 5 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                                   | SCALE        |
| DE APPR.   |          | XTUBE ASS'Y (205/212/412 HI FWD)                                                                                                                                                                                                                                                        | NTS          |
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Entered: \_\_\_\_\_ Date: \_\_\_\_\_



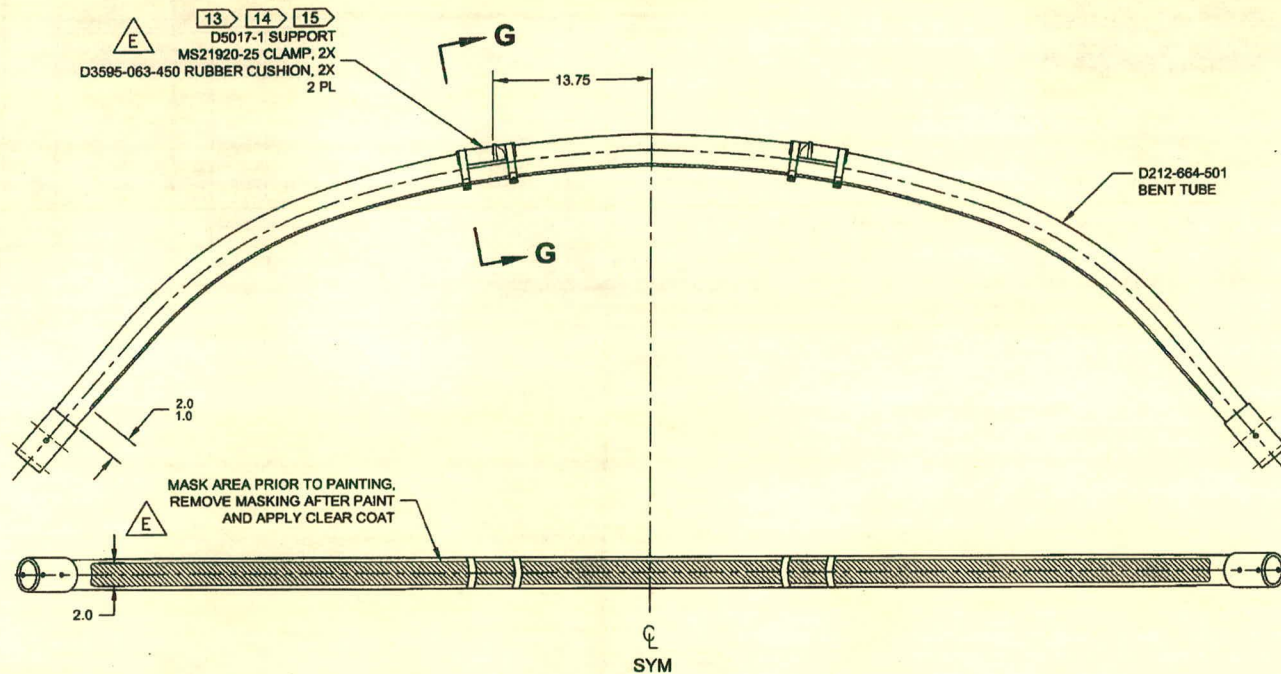
## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

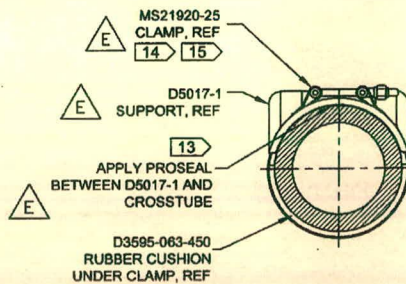
Route update only ☐

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| Job: _____<br><br>Part No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/> | <b>DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/> </div> <div>           Eng. (Non-AW) <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Water Jet <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Quality <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                      |  |                        |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Sequence #:                                                                                                                       | QTY Affected :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | MRB (QSI042)           |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | Completed By           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Lead hand / Supervisor |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | QC / QA Coordinator    |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                        |  |
| <b>Root Cause</b><br><br><div style="display: flex;"> <div style="flex: 1;">           Operator <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Presservation <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Human Factors <input type="checkbox"/> </div> <div style="flex: 1;"> <input type="checkbox"/> Pressure/Forced<br/> <input type="checkbox"/> Bending<br/> <input type="checkbox"/> Crushing<br/> <input type="checkbox"/> Cracks<br/> <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist<br/> <input type="checkbox"/> Marks/Chatter<br/> <input type="checkbox"/> Mislabeled         </div> </div> |                                                                                                                                   | <b>FAULT CATEGORY</b><br><br><div style="display: flex;"> <div style="flex: 1;"> <input type="checkbox"/> Contamination<br/> <input type="checkbox"/> Misaligned/off center<br/> <input type="checkbox"/> BOM/Route<br/> <input type="checkbox"/> Broken/Damage/Defect<br/> <input type="checkbox"/> Incomplete/Unclear Instructions<br/> <input type="checkbox"/> Drill Holes<br/> <input type="checkbox"/> Fit/Function         </div> <div style="flex: 1;"> <input type="checkbox"/> Power Loss/Surge<br/> <input type="checkbox"/> Folio/Program<br/> <input type="checkbox"/> Grain Direction<br/> <input type="checkbox"/> Weld<br/> <input type="checkbox"/> Wrong Stock Pulled<br/> <input type="checkbox"/> Out of Sequence<br/> <input type="checkbox"/> Off-set/Set-up         </div> <div style="flex: 1;"> <input type="checkbox"/> Positioned Wrong<br/> <input type="checkbox"/> Outside Tolerance<br/> <input type="checkbox"/> Drawing<br/> <input type="checkbox"/> Finish<br/> <input type="checkbox"/> Part Lost/Missing<br/> <input type="checkbox"/> Misread         </div> </div> |  |                        |  |
| Other/Details:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                        |  |





**D212-664-141B**  
**ASSEMBLY DETAIL**



**SECTION G-G**  
SCALE 4X

**RELEASED**  
2014-05-26

|            |          |                                                                                                                                                                                                                                                                                |              |
|------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     |          | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                      |              |
| DRAWN      |          | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                                    |              |
| CHECKED    |          | DRAWING NO.                                                                                                                                                                                                                                                                    | REV. E       |
| MFG. APPR. |          | D212-664-141                                                                                                                                                                                                                                                                   | SHEET 3 OF 5 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                          | SCALE        |
| DE APPR.   |          | XTUBE ASS'Y (205/212/412 HI FWD)                                                                                                                                                                                                                                               | NTS          |
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Entered: \_\_\_\_\_ Date: \_\_\_\_\_



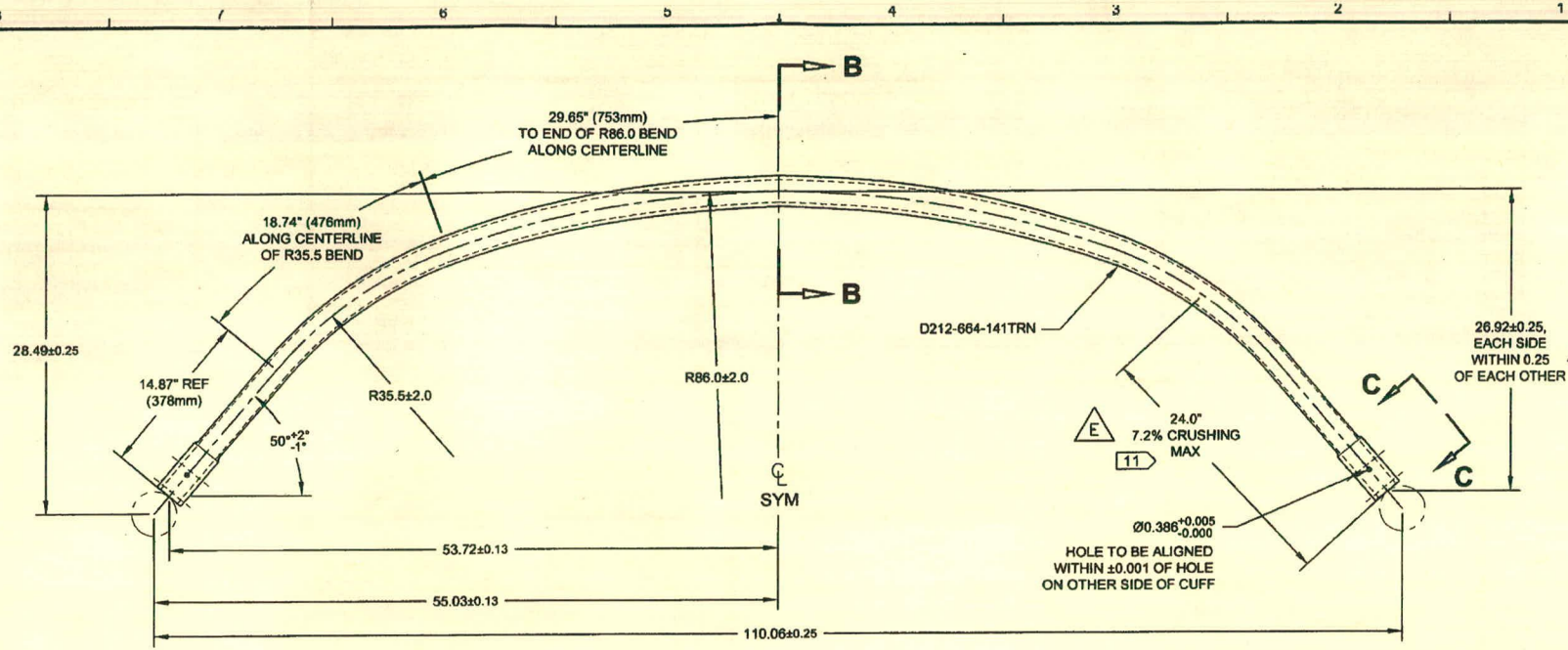
## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

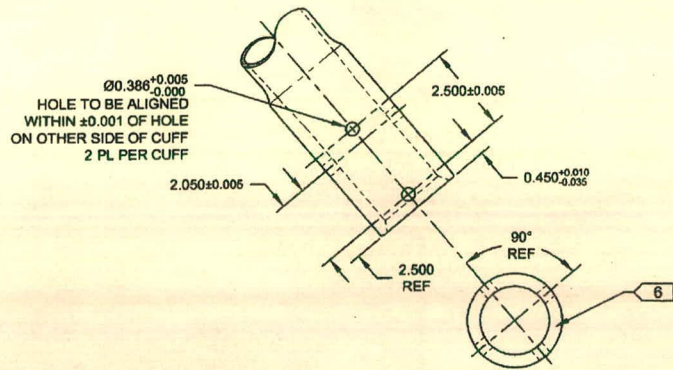
Route update only ☐

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------|--|
| Job: _____<br><br>Part No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/> | <b>DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/> </div> <div>           Eng. (Non-AW) <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Water Jet <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Quality <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                               |  |
| Date : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Sequence #: _____                                                                                                                 | QTY Affected : _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | MRB (QSI042)                  |  |
| <b>Description Work Order Deviation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                   | <b>Disposition</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | <b>Completed By</b>           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>Lead hand / Supervisor</b> |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                               |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | <b>QC / QA Coordinator</b>    |  |
| <b>Root Cause</b><br><br><div style="display: flex; flex-direction: column; align-items: flex-start;"> <div>Operator <input type="checkbox"/></div> <div>Manufacturing Process <input type="checkbox"/></div> <div>Equip/Tooling <input type="checkbox"/></div> <div>Handling/Presservation <input type="checkbox"/></div> <div>Material <input type="checkbox"/></div> <div>Product Improvement <input type="checkbox"/></div> <div>Process Improvement <input type="checkbox"/></div> <div>Human Factors <input type="checkbox"/></div> </div> |                                                                                                                                   | <b>FAULT CATEGORY</b><br><br><div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Pressure/Forced<br/> <input type="checkbox"/> Bending<br/> <input type="checkbox"/> Crushing<br/> <input type="checkbox"/> Cracks<br/> <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist<br/> <input type="checkbox"/> Marks/Chatter<br/> <input type="checkbox"/> Mislabeled         </div> <div style="width: 50%;"> <input type="checkbox"/> Contamination<br/> <input type="checkbox"/> Misaligned/off center<br/> <input type="checkbox"/> BOM/Route<br/> <input type="checkbox"/> Broken/Damage/Defect<br/> <input type="checkbox"/> Incomplete/Unclear Instructions<br/> <input type="checkbox"/> Drill Holes<br/> <input type="checkbox"/> Fit/Function         </div> <div style="width: 50%;"> <input type="checkbox"/> Power Loss/Surge<br/> <input type="checkbox"/> Folio/Program<br/> <input type="checkbox"/> Grain Direction<br/> <input type="checkbox"/> Weld<br/> <input type="checkbox"/> Wrong Stock Pulled<br/> <input type="checkbox"/> Out of Sequence<br/> <input type="checkbox"/> Off-set/Set-up         </div> <div style="width: 50%;"> <input type="checkbox"/> Positioned Wrong<br/> <input type="checkbox"/> Outside Tolerance<br/> <input type="checkbox"/> Drawing<br/> <input type="checkbox"/> Finish<br/> <input type="checkbox"/> Part Lost/Missing<br/> <input type="checkbox"/> Misread         </div> </div> |  |                               |  |
| Other/Details:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                               |  |

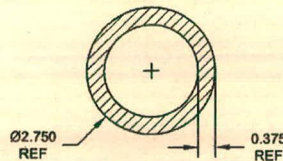




**D212-664-501**  
**BENDING AND DRILLING DETAIL** 11



**VIEW C-C: CUFF DETAIL**  
**SCALE 3X**



**SECTION B-B**  
**SCALE 4X**

**RELEASED**  
 2014-05-26

|                                                                                                                                                                                                                      |          |                                        |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------|--------------|
| DESIGN                                                                                                                                                                                                               | 40       | <b>DART AEROSPACE LTD</b>              |              |
| DRAWN                                                                                                                                                                                                                | 40       | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED                                                                                                                                                                                                              | 40       | DRAWING NO.                            | REV. E       |
| MFG. APPR.                                                                                                                                                                                                           | 40       | D212-664-141                           | SHEET 4 OF 5 |
| APPROVED                                                                                                                                                                                                             | 40       | TITLE                                  | SCALE        |
| DE APPR.                                                                                                                                                                                                             | 40       | XTUBE ASS'Y (205/212/412 HI FWD)       | NTS          |
| DATE                                                                                                                                                                                                                 | 14.04.01 | COPYRIGHT © 2000 BY DART AEROSPACE LTD |              |
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Entered: \_\_\_\_\_ Date: \_\_\_\_\_



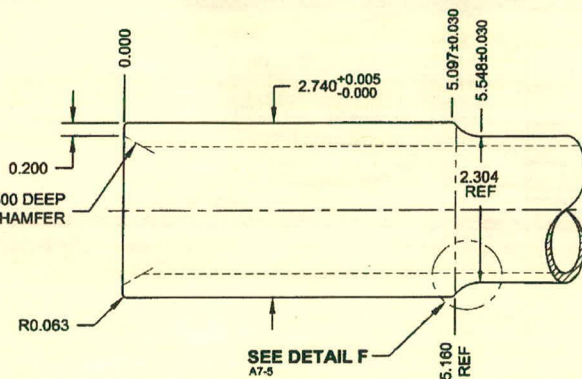
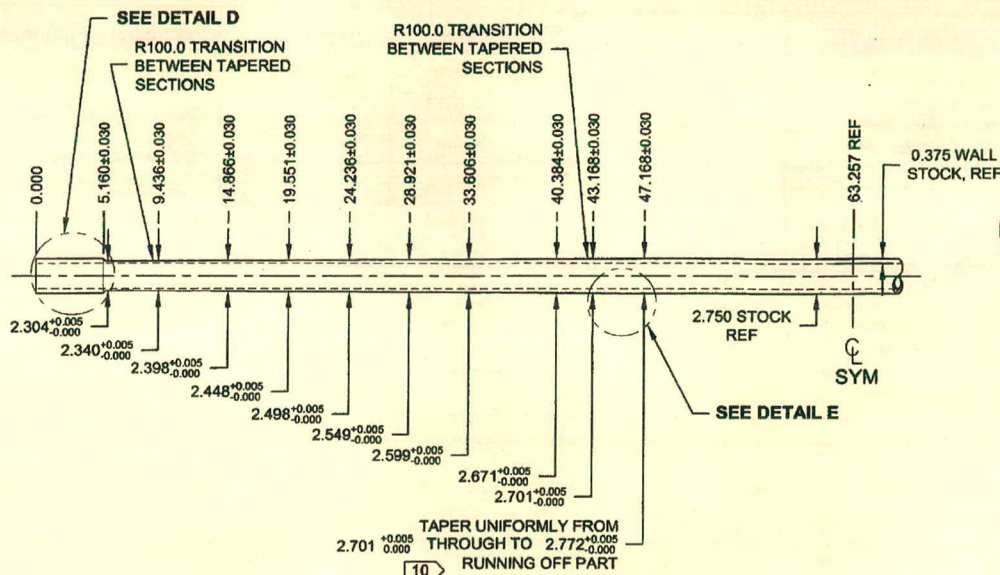
## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

Route update only ☐

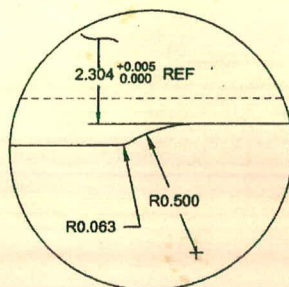
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| Job: _____<br><br>Part No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/> | <b>DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/> </div> <div>           Eng. (Non-AW) <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Water Jet <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Quality <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                      |  |                        |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Sequence #:                                                                                                                       | QTY Affected :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  | MRB (QSI042)           |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  | Completed By           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | Lead hand / Supervisor |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  | QC / QA Coordinator    |  |
| <b>Root Cause</b><br><br><div style="display: flex;"> <div style="flex: 1;">           Operator <input type="checkbox"/><br/>           Manufacturing Process <input type="checkbox"/><br/>           Equip/Tooling <input type="checkbox"/><br/>           Handling/Presservation <input type="checkbox"/><br/>           Material <input type="checkbox"/><br/>           Product Improvement <input type="checkbox"/><br/>           Process Improvement <input type="checkbox"/><br/>           Human Factors <input type="checkbox"/> </div> <div style="flex: 1;"> <input type="checkbox"/> Pressure/Forced<br/> <input type="checkbox"/> Bending<br/> <input type="checkbox"/> Crushing<br/> <input type="checkbox"/> Cracks<br/> <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist<br/> <input type="checkbox"/> Marks/Chatter<br/> <input type="checkbox"/> Mislabeled         </div> </div> |                                                                                                                                   | <b>FAULT CATEGORY</b><br><br><div style="display: flex;"> <div style="flex: 1;"> <input type="checkbox"/> Contamination<br/> <input type="checkbox"/> Misaligned/off center<br/> <input type="checkbox"/> BOM/Route<br/> <input type="checkbox"/> Broken/Damage/Defect<br/> <input type="checkbox"/> Incomplete/Unclear Instructions<br/> <input type="checkbox"/> Drill Holes<br/> <input type="checkbox"/> Fit/Function         </div> <div style="flex: 1;"> <input type="checkbox"/> Power Loss/Surge<br/> <input type="checkbox"/> Folio/Program<br/> <input type="checkbox"/> Grain Direction<br/> <input type="checkbox"/> Weld<br/> <input type="checkbox"/> Wrong Stock Pulled<br/> <input type="checkbox"/> Out of Sequence<br/> <input type="checkbox"/> Off-set/Set-up         </div> <div style="flex: 1;"> <input type="checkbox"/> Positioned Wrong<br/> <input type="checkbox"/> Outside Tolerance<br/> <input type="checkbox"/> Drawing<br/> <input type="checkbox"/> Finish<br/> <input type="checkbox"/> Part Lost/Missing<br/> <input type="checkbox"/> Misread         </div> </div> |  |                        |  |
| Other/Details:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                        |  |



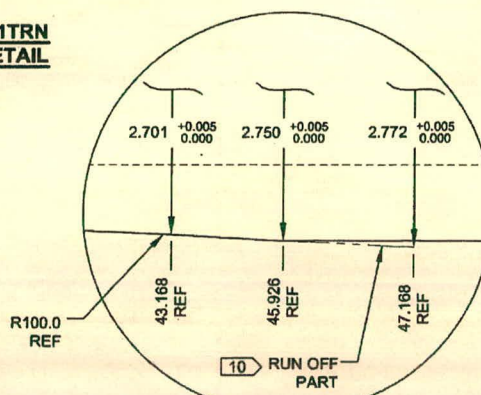


**DETAIL D:**  
**CROSSTUBE CUFF**  
SCALE 5X

**D212-664-141TRN**  
**TURNING DETAIL**



**DETAIL F:**  
**CUFF TRANSITION**  
SCALE 10X



**DETAIL E:**  
**TAPER RUN-OFF**  
NOT TO SCALE

**RELEASED**  
2014-05-26

|                                                                                                                                                                                                                                           |          |                                        |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------------------------------|--------------|
| DESIGN                                                                                                                                                                                                                                    | 90       | <b>DART AEROSPACE LTD</b>              |              |
| DRAWN                                                                                                                                                                                                                                     | 90       | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED                                                                                                                                                                                                                                   | DW       | DRAWING NO.                            | REV.         |
| MFG. APPR.                                                                                                                                                                                                                                |          | D212-664-141                           | SHEET 5 OF 5 |
| APPROVED                                                                                                                                                                                                                                  |          | TITLE                                  | SCALE        |
| DE APPR.                                                                                                                                                                                                                                  |          | XTUBE ASS'Y (205/212/412 HI FWD)       | NTS          |
| DATE                                                                                                                                                                                                                                      | 14.04.01 | COPYRIGHT © 2006 BY DART AEROSPACE LTD |              |
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Entered: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. \_\_\_\_\_

Route update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                        |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------|--|
| Job: _____<br><br>Part No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/> | <b>DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/> </div> <div>           Eng. (Non-AW) <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Water Jet <input type="checkbox"/><br/>           Supplier <input type="checkbox"/><br/>           Quality <input type="checkbox"/> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                        |  |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Sequence #:                                                                                                                       | QTY Affected :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | MRB (QSI042)           |  |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                   | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  | Completed By           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | Lead hand / Supervisor |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                        |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | QC / QA Coordinator    |  |
| <b>Root Cause</b><br><br><div style="display: flex; flex-direction: column;"> <div>Operator <input type="checkbox"/></div> <div>Manufacturing Process <input type="checkbox"/></div> <div>Equip/Tooling <input type="checkbox"/></div> <div>Handling/Presservation <input type="checkbox"/></div> <div>Material <input type="checkbox"/></div> <div>Product Improvement <input type="checkbox"/></div> <div>Process Improvement <input type="checkbox"/></div> <div>Human Factors <input type="checkbox"/></div> </div> |                                                                                                                                   | <b>FAULT CATEGORY</b><br><br><div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Pressure/Forced<br/> <input type="checkbox"/> Bending<br/> <input type="checkbox"/> Crushing<br/> <input type="checkbox"/> Cracks<br/> <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist<br/> <input type="checkbox"/> Marks/Chatter<br/> <input type="checkbox"/> Mislabeled         </div> <div style="width: 50%;"> <input type="checkbox"/> Contamination<br/> <input type="checkbox"/> Misaligned/off center<br/> <input type="checkbox"/> BOM/Route<br/> <input type="checkbox"/> Broken/Damage/Defect<br/> <input type="checkbox"/> Incomplete/Unclear Instructions<br/> <input type="checkbox"/> Drill Holes<br/> <input type="checkbox"/> Fit/Function         </div> <div style="width: 50%;"> <input type="checkbox"/> Power Loss/Surge<br/> <input type="checkbox"/> Folio/Program<br/> <input type="checkbox"/> Grain Direction<br/> <input type="checkbox"/> Weld<br/> <input type="checkbox"/> Wrong Stock Pulled<br/> <input type="checkbox"/> Out of Sequence<br/> <input type="checkbox"/> Off-set/Set-up         </div> <div style="width: 50%;"> <input type="checkbox"/> Positioned Wrong<br/> <input type="checkbox"/> Outside Tolerance<br/> <input type="checkbox"/> Drawing<br/> <input type="checkbox"/> Finish<br/> <input type="checkbox"/> Part Lost/Missing<br/> <input type="checkbox"/> Misread         </div> </div> |  |                        |  |
| Other/Details:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |                        |  |